Maternal Emotion Socialization, Anxiety, and Child Temperament: Prospective Associations with Children's Regulation of Anxiety

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Abstract

The ability to self-regulate one's emotions is an important component in the development of anxiety symptoms and disorders during early childhood. Whereas it has been well established that certain parenting behaviors are related to child anxiety, the impact of specific parenting behaviors in socializing children's emotion, such as maternal emotion coaching and maternal expressivity, have been researched far less. This study examined if, and to what extent, mothers' emotion coaching behaviors and emotion expression predicts children's adaptive and maladaptive regulation of anxiety above and beyond child fearful temperament and maternal anxiety. Participants were 61 mother-child dyads drawn from a larger longitudinal study. Data collection occurred when target children were three/four and five years old**.** At each time point, mothers completed the State-Trait Anxiety Inventory's trait scale and the Child's Behavior Questionnaire Short Form, which measure maternal anxiety and child temperament respectively. Child anxiety was measured during a laboratory task at age five. Maternal emotion coaching was measured during a one day naturalistic observational procedure at home when children were three or four years old. Regression analyses were conducted to investigate the contribution of maternal emotion coaching, maternal anxiety symptoms, mother positive and negative expression, and child temperament at age 3 or 4 to child emotion and regulatory behaviors in response to anxiety at age 5. Results of this study further clarify the interactions between mothers and children during the preschool years that can predict or even sustain children's adaptive and maladaptive regulation of anxiety.

Maternal Emotion Socialization, Anxiety, and Child Temperament: Prospective Associations with Children's Regulation of Anxiety

Anxiety disorders are among the most common forms of childhood psychopathology, highly comorbid with each other and other disorders, associated with both short-term and long-term impairments on a child's functioning with the potential to persist across development and into adulthood (Buss & McDoniel, 2016). The developmental course of children's anxiety symptoms is complex, involving biological, psychological, and social processes (Buss & McDoniel, 2016). Currently, prospective studies examining the role of parental emotion socialization in the development of childhood anxiety is limited. Moreover, the relations between emotion socialization and child anxiety has not been examined in children younger than school age. This study will examine the factors that contribute to anxiety and the regulation of anxiety in children. Examining these associations can broaden our understanding of the etiology of childhood anxiety during the preschool years. Results of this study could also have implications for current and future parenting and family interventions.

Child Temperament and Childhood Anxiety

It has been well established that temperament plays a role in the development of anxiety. Temperament refers to stable, biologically based individual differences in behavioral inclinations that emerge in early infancy (Goldsmith et al., 1987). Two closely related temperamental constructs, behavioral inhibition and shyness, both of which involve temperamental fear, have been most extensively studied in relation to childhood anxiety. Behavioral inhibition represents the tendency to withdraw from, avoid, or react fearfully to novel or unfamiliar situations (Buss & McDoniel, 2016), whereas shyness can be understood as the temperamental tendency to

experience fear and anxiousness in the face of new social situations and perceived social evaluation (Coplan, Reichel, & Rowan, 2009). Both shyness and behavioral inhibition are considered strong predictors of anxiety development in childhood (Brooker & Buss, 2014; Buss & McDoniel, 2016; Buss, 2011; Dougherty et al., 2013; Hudson, Dodd, & Bovopoulos, 2011). A recent prospective study investigating temperament's role in the development of anxiety disorders found that behavioral inhibition at age 4 was a significant predictor of anxiety at age 6 (Hudson, Dodd, Lyneham, & Bovopoulous, 2011). Moreover, compared to the behaviorally uninhibited group, the behaviorally inhibited group were significantly more likely to meet criteria for anxiety and social phobia and had a higher number of anxiety diagnoses even after controlling for baseline anxiety (Hudson, Dodd, Lyneham, et al., 2011). In a similar prospective study, Prior, Smart, Sanson, and Oberklaid (2000) found that shyness at 3-4 years of age was associated with an increased risk of anxiety disorders at ages 13-14. However, not all children with fearful temperaments become anxious. Thus, it is important to examine temperament's role in the trajectory of anxiety development within the context of environmental and socioemotional factors as well.

Maternal and Child Anxiety

Recent research has emphasized the role of parental anxiety and parenting behaviors in the development of childhood anxiety (Pereira, Barros, Mendonça, & Muris, 2014). It is suggested that maternal anxiety confers both genetic and environmental risk for child anxiety via encouragement of avoidant behaviors, verbal communication of threat and the modeling of anxious behaviors (Field, Lawson, & Robin Banerjee, 2008; Hudson, Dodd, & Bovopoulos, 2011; Murray et al., 2008). Moreover, it appears that toddlers can learn specific fears through modeling of a parent's affective reaction to a new stimulus (Dubi, Rapee, Emerton, &

Schniering, 2008). A number of studies have found significant effects of parental overcontrol/overprotection on children's anxiety (Affrunti & Ginsburg, 2012; Cooper, Fearn, Willetts, Seabrook, & Parkinson, 2006; McLeod, Wood, & Weisz, 2007; Pereira et al., 2014). Further, in a recent study examining parental anxiety behaviors' prospective association with children's anxiety, Borelli, Margolin, and Rasmussen (2015) found that parental anxiety not only directly predicted child anxiety, but also indirectly contributed to child anxiety through parenting behavior such as parental overcontrol.

Maternal Emotion Socialization and Child Anxiety Regulation

One aspect of parenting, emotion socialization, has not received much attention in understanding the development of anxiety. Emotion socialization is the process by which children learn about their feelings and emotions and have their emotions responded to by parents or caregivers (Shaffer, Suveg, Thomassin, & Bradbury, 2012). Through parental emotional socialization, children learn how to regulate their emotional responses in times of stress.

The inability to self-regulate one's emotions is an important component in child anxiety (Williams & Woodruff-Borden, 2015). In fact, when compared with nonanxious children, children with anxiety disorders reported more dysregulated expressions of worry, sadness and anger, and reported less adaptive coping with these same emotions (Suveg & Zeman, 2004). These findings suggest that anxious children may not understand that emotions are elements within their control, and have greater difficulty than nonaxious children with effectively regulating negative affect (Williams & Woodruff-Borden, 2015).

Parental emotion socialization strategies have been shown to be influential in children's development of emotion-regulation. In particular parental emotion coaching, which involves parents' acceptance, awareness, and facilitation of problem-solving with children's negative

emotions, has been shown to have a profound impact on a variety of child emotional outcomes such as the ability to self-regulate their own negative emotions (Gottman, Katz, & Hooven, 1996). Studies examining the behaviors of parents with a clinically anxious child and those without a clinically anxious child have found support for the notion that parents of anxious children engage in more maladaptive emotion-related behaviors than parents of non-anxious children (Hudson, Comer, & Kendall, 2008; Suveg et al., 2008).

Regarding emotion coaching, parents of anxious youths engage in fewer explanatory discussions of emotion resulting in a lack of opportunities for anxious youths to process complex emotions via discussion in a supportive family environment (Suveg et al., 2008). A recent study found that mothers of more anxious children engage in more psychologically controlling behaviors (e.g. attempting to manipulate or invalidate the child's emotions) that showed significant associations with child anxiety (Brumariu & Kerns, 2015). A novel feature of Brumariu and Kerns' (2015) study was their examination of maternal elaboration on emotional events as significantly related to child anxiety. They found that mothers of more anxious children elaborated less in anxiety provoking conversations with their child, were less supportive, and showed less warmth (Brumariu & Kerns, 2015). Further, more anxious children were less engaged in the emotion discussions, had more intense displays of emotions, and exhibited less congruencies between their behaviors and emotions, suggesting that the children had trouble speaking openly about the topic and staying emotionally regulated during the conversation (Brumariu & Kerns, 2015). Although these results are significant, they do not identify the direction of effects between parental emotion socialization and childhood anxiety, and the specific link between parents' emotion coaching and child anxiety is not well understood. Prospective studies utilizing longitudinal datasets are better suited to evaluate the predictive

quality of parent emotion socialization as it relates to childhood anxiety. Moreover, the relations between coaching or discussion of emotion and childhood anxiety have not been examined in children younger than school age.

Family is considered the primary context in which children first learn about emotion expression, the connotations they convey, and the many ways to regulate them (Eisenberg et al., 2003). Furthermore, emotional climate in the home likely contributes to children's emotional reactivity and their development of adaptive emotion regulation strategies (Eisenberg et al., 2003). The quality of emotional climate is dependent on the amount of emotion, both positive and negative, expressed verbally and nonverbally in the family, particularly by parents (Morris, Silk, Steinberg, Myers, & Robinson, 2007). There is an extensive amount of evidence suggesting that parental expression of emotion is linked to children's socioemotional development.

Parental expression of positive emotion has largely been shown to have a positive influence on children's socioemotional development. Various studies have demonstrated a link between parental positive expression and children's prosocial behavior, emotion understanding, social competence, and positive emotionality (Cumberland-Li, Eisenberg, Champion, Gershoff, & Fabes, 2003; Eisenberg et al., 2001, 2003). Parental expression of negative emotions, however, tends to be associated with less desirable developmental outcomes such as externalizing behaviors (Eisenberg et al., 2001).

Fewer studies have specifically examined maternal emotion expression and emotion regulation. In a study conducted by Eisenberg et al. (2001), maternal expression of both positive and negative emotions was found to be an important element of children's regulation and social functioning. Additionally, a research study examining positive expressivity in particular found

that children from more expressive families displayed more adaptive regulatory strategies such as self-soothing when they were left in a room with a stranger (Garner, 1995).

Taken together, parental emotion coaching and parental emotional expression during the preschool years may have a particularly formative influence on children's later emotion regulation and self-regulatory capacities (Diamond & Aspinwall, 2003). During the preschool years, children are beginning to shift from simply controlling their emotional states to developing a wider understanding with their own ability to regulate and moderate emotional states. Additional prospective studies examining these associations are needed to better understand the developmental implications of parental emotion coaching and emotional expressivity on children's regulatory capacities during the preschool years. Furthermore, the prospective studies examining these associations are limited in their reliance on self-report measures of parental expressivity. While many of these studies observed children's emotion regulation, obtaining parental expressivity scores through observational measures reduces the risk of biased data.

The Current Study

Whereas it has been well established that certain parenting behaviors are related to child anxiety, the impact of specific parenting behaviors in socializing children's emotion, such as maternal emotion coaching and maternal expressivity, have been researched far less. In addition, an important limitation of many of the studies reviewed thus far has been their reliance on self-report or parental report measures for data collection. For those studies that did utilize an observational method, only laboratory based observations were employed. None of the studies that were reviewed observed the parent-child relationship within its natural environment. Due to the methodological advance in observational data it is now possible to observe parent-child interactions in the naturalistic home setting via automatic recording software. Utilizing the

naturalistic observational method in the present study will address a large gap in previous research by providing an ecologically valid assessment of the links between parent-child interactions and child anxiety symptoms in everyday life. This study focuses on maternal emotion coaching strategies, and examines how this practice relates to children's regulation of anxiety. The goal of this study is to examine if and to what extent mothers' emotion coaching behaviors and emotion expression predicts children's adaptive and maladaptive regulation of anxiety above and beyond child fearful temperament and maternal anxiety.

To fully examine the scope of children's regulation of anxiety, adaptive and maladaptive regulation of anxiety is assessed based on children's emotion expression as well as their use of regulatory strategies in response to stress. Maladaptive regulation of anxiety includes children's expression of anxiety and their use of discouragement talk whereas adaptive regulation of anxiety includes children's expression of positive emotion and their use of problem-solving talk as an emotion regulation strategy. Significant research has been dedicated to examining the associations between language skills and children's development of emotion regulation during early childhood. Children may engage in language practices such as self-talk to communicate about social interactions or to learn about appropriate ways to regulate their own emotions (Eisenberg, Sadovsky, & Spinrad, 2005). Language and self-talk plays a significant role in preschool-age children's regulation of negative emotions. Notably, children's private speech as a resource for self-regulation can contribute to both adaptive and maladaptive regulatory processes. Children's verbal regulation strategies include, among others, such behaviors as self-distraction and verbal problem solving. Rather than misbehaving or crying while under stress, children may employ verbal regulation strategies such as self-distraction and verbal problem solving in order regulate emotion while under stress. One recent study found that the intricacy of

a child's spontaneous speech predicted the generation of emotion regulation strategies while engaging in a frustration eliciting task (Cole, Dennis, Smith-Simon, & Cohen, 2009).

The use of a longitudinal dataset in the proposed study will further clarify the direction of effects linking parenting and child anxiety outcomes. The study will further examine the interactions between mothers and children during the preschool years that can predict or even sustain children's maladaptive anxiety regulation. This study will address four questions: 1) How does child fearful temperament predict children's regulation of anxiety? 2) How do maternal anxiety symptoms predict children's regulation of anxiety? 3) How does maternal emotion coaching predict children's regulation of anxiety? 4) How does mother's expression of positive and negative emotion predict children's regulation of anxiety? Based on previous research, it is hypothesized that child fearful temperament, maternal anxiety, and mother's expression of negative emotion will be positively associated with children's maladaptive regulation of anxiety—specifically, children's anxiety expression and use of discouragement talk in response to stress. It is also hypothesized that mother's emotion coaching and mother's expression of positive emotion would predict children's adaptive regulation of anxiety—specifically, children's positive expression and use of problem-solving talk in response to stress. This study is unique in that it focuses specifically on mother's emotion socialization, whereas previous studies tend to look at more general parenting behaviors.

Method

Participants

Participants were 61 mother-child dyads (32 girls) drawn from a larger longitudinal study. At the time of enrollment children were 3.21 years old (*SD* = .18) and mothers were 31.38 years of age (*SD* = 5.72). The majority of the mothers were White (73.77%) and Black or

African American (24.59%); 60.65% of the mothers had at least a college degree, 31.15% had some college education, and 8.20% had high school education. Most of the mothers (75.41%) were married or living with someone, 16.39% were never married/single, and 8.20% were separated, divorced, or widowed. Children were assessed at two points in time, time 1 (T1) when they were 3 or 4 years old and time 2 (T2) when they were 5 years old. Data were collected through questionnaires, naturalistic observation, and laboratory observation.

Procedures

Naturalistic observation. At age 3 or 4, mothers and their children participated in a one-day naturalistic observational procedure, where their conversations were audio recorded. Participants were given a recording device (iPod touch) that was preloaded with iEar software (Mehl, Robbins, & Deters, 2012). A child-sized T-shirt (with a front pocket to hold the iPod) was also provided for the child to wear during his/her waking hours. The iPod touch was pre-set to automatically record sounds in the child's surroundings for 1 minute every 10 minutes. The audio recordings were transcribed and coded for parental emotion coaching and parent and child emotion expression. Participants were instructed to do the procedure on a "typical weekend day" and were also asked to complete an event diary that recorded major activities of the child, time of day when they occur, and people who are present during these activities.

Laboratory observation. At age 5, in laboratory visits, mother-child dyads participated in a puzzle task wherein the children were given three increasingly difficult shape puzzles to complete under a time restriction to elicit anxiety. The experimenter explains that the child needs to complete each puzzle in the order they are numbered as each puzzle becomes more difficult. The mother was told that she could help the child if she felt the child needed help, but that she should not complete the puzzle for the child. The experimenter also informed the child that

he/she will be timing the child and assessing how well he or she completes the task. The time allowed to complete the first puzzle was 1 minute, the second puzzle 2 minutes, and the third puzzle 3 minutes. The experimenter remained in the room sitting next to the dyad and periodically announced the time remaining to complete the puzzle. The task is designed to elicit anxiety by creating a high-pressure, and tense environment.

Measures

Maternal Trait Anxiety. At each time point, mothers complete the State-Trait Anxiety Inventory (STAI; Spielberger et al., 1983). Maternal trait anxiety is measured based on mother's report on the STAI's trait scale, which includes 20 items (e.g. "I feel inadequate") that are rated on a 4-point Likert scale. Cronbach's alpha = 0.96

Child fearful temperament. Mothers also complete the Child's Behavior Questionnaire Short Form (CBQ; Rothbart et al., 2001) which assesses children's temperament. Mothers rate how their child reacts to various situations on a 6-point scale. A subscale of the CBQ, *fear,* is included in the present study. Chronbach's alpha = 0.72

Mothers' emotion coaching behavior and emotion expressions were coded from naturalistic observations conducted at children's homes at T1.

Maternal emotion coaching. Audio recordings of mother-child conversations at age three or four were coded for maternal emotion coaching behaviors including, *Emotion Labeling* (labels child's or someone else's emotion)*, Elaboration* (facilitates discourse, asks questions, or guides child to agreed understanding about emotion)*, Acceptance* (of child's negative emotions)*, Comfort/Empathy* (comforting child)*, Problem Solving* (suggests or helps child come up with coping strategies for stressful situations)*, Direct Teaching* (suggesting without child's input)*, Discussing Cause of Emotion* (talking with child about cause of current emotion)*,* and *Reasoning*

(gives reasons why child's desire cannot be accomplished to pacify negative emotions). Negative maternal emotion coaching behaviors were coded, *Dismissing of Child's Negative Emotions* (neglecting or ignoring child's negative emotions), and *Punishment of Child's Negative Emotions* (criticizes/punishes child's negative emotions). The kappa for maternal emotion coaching was 0.83.

Mothers' positive expression. Audio recordings of mother-child conversations at age three or four were also coded for mothers' positive expression including, laughing and singing. The Inter-rater reliability for mother's positive expression was kappa = 0.76

Mothers' negative expression. Audio recordings of mother-child conversations at age three or four were coded for mothers' negative expressions including *yelling*, *sighing*, and *crying.* The Inter-rater reliability for mother's negative expression was kappa = 0.90

At T2, children were observed during the anxiety eliciting puzzle task, and their emotion expressions and emotion regulation strategies were coded.

Child positive expression and problem-solving talk. The puzzle task at age 5 was used to measure desirable child outcomes in relation to the experience and management of anxiety. Two desirable outcomes were measured, child positive expression and child problem solving talk. Child positive expression was coded based on their facial expression (smiling, animated expression), their tone of voice (inflection indicating positivity, light, lilting quality), their gestures (clapping, dancing), and their verbal statements ("I like this!", "This is Fun!"). Inter-rater reliability for child positive expression was kappa = 0.75. The behavioral code of child *problem solving talk* includes talking through activity as they complete it to clarify how they will get it done and explaining what they are doing or about to do to succeed at the task. *Problem*

solving talk can include statements such as, "I'll put the blue piece here." or "this is what I will do next." The Inter-rater reliability for problem solving talk was kappa = 0.79.

Child anxiety and discouragement. The puzzle task at age 5 was used to measure undesirable child outcomes in relation to the experience and management of anxiety. The videotaped puzzle task was coded for child anxiety and related behavior. Recordings of the puzzle task were coded for children's anxiety expressions based on their facial expressions (raised or furrowed eyebrows nervous or worried looks), their tone of voice (elevated voice tone, rapid speech), their gestures (jerk, tense movements, tense body posture), and their verbal statements ("I'm not going to get it done!"). The videos were also coded for children's behavior in relation to the regulation of anxiety, such as *comfort seeking* (the child self-soothes or requests comfort from mother), *discouragement* (the child indicates through behaviors and/or statements that he or she is discouraged), *help seeking/information gathering* (the child looks to mother to help with task), and the amount of time they are *engaged or disengaged* in the task. Observations of the puzzle task were double coded to assess inter-rater reliability. The reliability for the behavioral codes include comfort seeking (kappa = 0.86), discouragement (kappa = 0.80), self-soothing (kappa = 0.80), help seeking/information gathering (kappa = 0.78), and engaged (kappa = 0.93). The reliability, kappa, for the anxiety expression coding was 0.77. Children's anxiety expressions and behaviors were coded second by second, and the final scores represent the percentage of time that each expression or behavior occurs out of the duration of the task.

Data Analysis

To investigate the contribution of maternal emotion coaching, maternal anxiety symptoms, mother positive and negative expression, and child temperament at age 3 or 4 to child emotion and regulatory behaviors during the puzzle task at age 5, four regression analyses were

conducted, with child emotion/behavior observed during the anxiety task as the dependent variables and child temperament, maternal anxiety, and maternal emotion coaching/expression as the independent variables. For each regression analysis, all independent variables were initially included in the analysis, and those that were not at least marginally associated ($p < 0.10$) with the dependent variable were subsequently removed from the final model for the purpose of parsimony.

Results

Correlations and Descriptive Statistics

Table 1 contains the mean, standard deviations, and bivariate correlations of variables in this study. There were several significant bivariate correlations worthy of discussion. Mothers positive expression was negatively correlated with child temperamental fear ($r = -0.30$, $p < 0.001$). Furthermore, mothers with more positive expressions at home tended to have children who displayed more positive emotion ($r = 0.33$, $p < 0.05$) and engaged in more problem- solving talk in the lab ($r = 0.29$, $p < 0.05$). Mothers' use of emotion coaching was also significantly related to mothers' positive expression ($r = 0.45$, $p < 0.001$). Additionally, child discouragement was positively associated with child anxiety in the laboratory setting ($r = 0.51$, $p < 0.05$). Child sex was positively correlated with child anxiety expressions in the lab ($r = 0.27$, $p < 0.05$) such that, males displayed more anxiety-related expressions and behaviors in the lab than did females.

Table 1. Descriptive statistics and bivariate correlations of study variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Child Anxiety	1.01	0.78										
2. Child Discouragement	1.81	2.32	0.51***									
3. Child Problem Solving Talk	4.58	3.85	0.22†	0.18								
4. Child Positive	6.00	7.19	0.32*	0.14	0.16							
5. Child Sex	0.49	0.50	0.27*	0.22†	-0.05	-0.21						
6.Temperamental Fear	3.87	1.13	-0.09	-0.14	-0.24†	-0.11	0.09					
7. Maternal Trait Anxiety	43.61	14.28	-0.13	-0.15	-0.04	-0.24†	-0.07	0.09				
8. Mother Positive	14.34	17.45	0.19	0.022	0.29*	0.329*	-0.11	-0.30***	0.14			
9. Mother Negative	4.53	8.96	-0.12	-0.09	-0.22†	0.25†	-0.08	-0.03	0.12	0.09		
10. Maternal Emotion Coaching	7.61	11.49	0.21	0.17	0.17	0.33	-0.10	-0.17	0.17	0.45***	0.05	

Note: †p < 0.10; *p < 0.05; **p<0.01; ***p<0.001. Child sex: female = 0 male =1.

Prospective Contributions of Maternal and Child Variables on Children's Adaptive Regulation of Anxiety

To investigate the prospective contribution of maternal trait anxiety, maternal emotion coaching, mother positive and negative expression, and child temperamental fear on desirable child outcomes during a laboratory task, two regression analyses were conducted (Table 2). Backward selection was used for the models with each model containing all of the independent variables in the beginning. Next, all non-significant variables were removed until only significant or marginally significant variables remained.

Table 2. Regression analyses on children's adaptive regulation of anxiety

	Child Positive $R^2 = 0.18$*				Child Problem Solving Talk $R^2 = 0.16$**			
	B	SE	β	t	B	SE	β	t
Child Sex	---	---	---	---	---	---	---	---
Maternal Trait Anxiety	0.11	0.06	0.21	1.69†	---	---	---	---
Temperamental Fear	-1.34	0.8	-0.21	-1.69†	---	---	---	---
Maternal Emotion Coaching	0.16	0.08	0.26	2.06*	---	---	---	---
Mother Positive	---	---	---	---	0.08	0.03	0.34	2.7**
Mother Negative	---	---	---	---	-0.16	0.07	-0.28	-2.29*

Note: †p < 0.10; *p < 0.05; **p < 0.01. Child sex: female = 0 male =1.

Child positive expression. The first regression analysis examined the desirable outcome of child positivity at home with maternal trait anxiety, child temperamental fear, and maternal emotion coaching as the independent variables and child positive as the dependent variable. The model predicting child positivity had an $R^2 = 0.18$, $p < 0.01$. The model had only one significant predictor of child positive expression in the lab, maternal emotion coaching ($ß = 0.26$, $p < 0.05$). Maternal emotion coaching at T1 predicted child's positive emotion during the laboratory task at T2 indicating that mothers who engage in more emotion coaching strategies in the home have children who display more positive emotions during times of stress. Maternal trait anxiety and child temperament were only marginally related to child positivity. Maternal trait anxiety was positively related to child positivity, whereas child temperamental fear was negatively associated with child positivity.

Child problem solving talk. The second regression analyses examined child problem solving talk during in the lab with mothers' positive and negative expressions in the home as the independent variables and children's problem solving talk as the dependent variable. The model predicting child problem solving talk had an $R^2 = 0.16$, $p < .01$. Both mothers' positive and negative expression at home during T1 significantly predicted child problem solving talk in the lab at T2. Mothers' positive expression at home was a significant predictor ($ß = 0.34$, $p < 0.01$) of child problem solving talk, indicating that mothers who display more positive expressions at home had children who displayed more problem-solving strategies when under pressure. Similarly, mothers' negative expression at home was also a significant predictor ($ß = -0.28$, $p < 0.05$), indicating that mothers who engaged in more negative emotional expression at home had children who displayed less problem-solving strategies while under stress.

Prospective Contributions of Maternal and Child Variables on Children's Maladaptive Regulation of Anxiety

To investigate the prospective contribution of child sex, maternal trait anxiety, and mother positive expression on undesirable child outcomes, two regression analyses were conducted (Table 3). Backward selection was used for the models with each model containing all of the independent variables in the beginning. Next, all non-significant variables were removed until only significant or marginally significant variables remained.

Table 3. Regression analyses on children's maladaptive regulation of anxiety

	Child Discouragement $R^2 = 0.10$*				Child Anxiety $R^2 = 0.16$**			
	B	SE	β	t	B	SE	β	t
Child Sex	1.14	0.59	0.25	1.95†	0.58	0.20	0.37	2.87**
Maternal Trait Anxiety	0.04	0.02	0.23	1.80†	---	---	---	---
Temperamental Fear	---	---	---	---	---	---	---	---
Maternal Emotion Coaching	---	---	---	---	---	---	---	---
Mother Positive	---	---	---	---	0.02	0.01	0.32	2.42*
Mother Negative	---	---	---	---	---	---	---	---

Note: †p < 0.10; *p < 0.05; **p < 0.01. Child sex: female = 0 male =1.

Child Anxiety. The first regression analysis examined the prospective contribution of child sex and mother positive expression on child anxiety in the lab. The model predicting child

anxiety had an $R^2 = 0.16$, $P < 0.01$. Both child sex and mother positive expression were significant predictors of child anxiety. Child sex (ß = 0.37, $p < 0.01$) significantly predicted child anxiety during the laboratory task. Boys were significantly higher on anxiety than girls. Unexpectedly, mother positive expression (ß = 0.32, $p < 0.05$) significantly predicted child anxiety as well.

Child Discouragement. The second regression analysis examined predictors of child discouragement in the lab with child sex and maternal trait anxiety as independent variables and child discouragement as the dependent variable. The model predicting child discouragement had an $R^2 = 0.10$ $p < 0.05$. While no predictors were significant at the .05 level, child sex (ß = 0.25) and maternal trait anxiety (ß = 0.23) were significant at the 0.10 level.

Discussion

It was hypothesized that mother's emotion coaching and mother's expression of positive emotion would predict children's adaptive regulation of anxiety—specifically, children's positive expression and use of problem-solving talk in response to stress. It was also hypothesized that child fearful temperament, maternal anxiety, and mother's expression of negative emotion will be positively associated with children's maladaptive regulation of anxiety—specifically, children's anxiety expression and use of discouragement talk in response to stress. This study found that higher levels of maternal emotion coaching and maternal positive expression was related to higher levels of children's positive expression and problem-solving talk whereas higher levels of maternal negative expression was related to lower levels of children's positive expression and problem-solving talk during a stressful situation. Children's temperamental fear was only marginally related to lower levels of children's positive expression. Regarding maladaptive regulation of anxiety, results of the study showed that male children and

higher levels of mother's positive expression was related to higher levels of child anxiety. Additionally, child sex and maternal trait anxiety was marginally related to higher levels of child discouragement.

The findings regarding the adaptive regulation of anxiety are of particular importance. As expected, both maternal emotion coaching and mother's expression of emotion significantly predicted children's adaptive regulation of anxiety. Specifically, higher levels of maternal emotion coaching predicted higher levels of children's positive expression and higher levels of mother's positive expression predicted higher levels of children's problem solving-talk as a regulatory strategy. It is important to note that both maternal emotion coaching and mother's expression of emotion was assessed at home, one or two years before the assessment of children's regulation of anxiety. This suggest that maternal emotion coaching strategies may have a far-reaching relation with children's adaptive regulation of anxiety through positive emotion expression in response to stress. The finding that mothers who engaged in more emotion coaching behaviors tend to have children who display more adaptive emotion-regulation in response to stress is consistent with previous research (Eisenberg et al., 2003; Gottman et al., 1996).

Moreover, mother's emotion expression in the home during early preschool years, may have significant implications for children's adaptive regulation of anxiety at age five. As expected, mother's positive and negative emotion expression predicted children's use of problem-solving talk as an emotion regulation strategy. Mothers with higher levels of negative emotion expression had children who engaged in less problem solving talk whereas mother's with higher levels of positive emotion expression had children who engaged in more problem solving talk while under stress. The finding that mother's expression of positive and negative

emotion, both in interactions with their children and more generally in the family, affect children's emotion regulation skills and social competence is consistent with previous research (Eisenberg et al., 2001). Thus, these findings support the view that maternal emotion coaching and mother's positive emotion expression between the ages three and four might have an especially formative influence on children's later adaptive emotion-regulation capacities in response to stress.

Child fearful temperament only marginally predicted children's decreased positive expressions in response to stress. This is inconsistent with previous research that has identified significant, predictive links between children's fearful temperament and children's maladaptive regulation of anxiety (Buss, 2011). A possible explanation for this inconsistent finding is the use of maternal-report to assess child temperament. Mother's may have under-reported scores they believed to be less acceptable to minimize their children's behavior problems for social desirability reasons. Assessing this independent variable using observational data may result in a more valid measurement of children's fearful temperament.

One significant predictor of children's maladaptive regulation of anxiety was child sex. Specifically, boys displayed significantly higher levels of anxiety than did girls. Boys also displayed marginally significant higher levels of discouragement expression. Unexpectedly, mother's positive expression was related to higher levels of child anxiety. It is possible that mothers attempted to be more positive around their children when they were more anxious and expressed more positive emotions as an attempt to alleviate children's distress. Second, maternal anxiety was marginally related to both higher levels of children's positive expression and higher levels of children's expression of discouragement. It is unclear why maternal trait anxiety predicted higher levels of both adaptive and maladaptive emotion expression in response to

stress. It is possible that using a questionnaire to measure maternal trait anxiety resulted in self-report bias. Thus, it may be beneficial to assess mother's anxiety-related emotions and behaviors using observational data in order to obtain a more accurate representation of this measure.

There were several strengths of this study. The main strength of the study is rather than relying on self-report family expressiveness questionnaire, maternal expression of emotion was assessed using naturalistic observation, thus decreasing the potential of self-report bias and increasing the studies ecological validity. Moreover, rather than assessing maternal emotion coaching based on laboratory observations, maternal emotion coaching was also assessed using naturalistic observation, therefore further increasing the study's ecological validity. Additionally, the use of a longitudinal data set helped to further clarify the direction of effects linking parenting behaviors and children's regulation of anxiety over time. Specifically, the outcome variable, child anxiety and children's regulation of anxiety, are assessed at a later time and in a different setting. A final strength of this study is the focus of not just children's displays of anxiety, but also their regulation of anxiety.

Limitations

There were also some weaknesses of this study. Frist the sample size was relatively small (N = 61). As a result, some of the data analysis was held back due to small sample size. The small sample size is due, in part, by the limited number of families who were willing to wear the recording device. Additionally, sampling bias occurred as a result of the following factors: 1) the family was willing to participate and 2) the larger study from which the current sample was drawn over-sampled mothers with elevated depression symptoms. Finally, for the naturalistic observation, only one day was recorded, which may not be representative of a child's everyday life.

Future Directions

While this study provides valuable insights, research examining the interactions between mothers and their children during the laboratory task used in the current research to assess child anxiety may further the understanding between maternal and child characteristics and children's regulation of anxiety. Specifically, investigating the co-regulatory behaviors between mothers and their children may help inform the findings of the current study. Since mothers are present during the task used to assess children's regulation of anxiety, examining mother's own emotion regulation strategies as well their facilitation of regulatory strategies with their children would help to further identify maternal behaviors that influence children's adaptive and maladaptive coping while under stress. Furthermore, investigating children's anxiety regulation using additional observational data obtained from other laboratory tasks that were designed to elicit children's emotions may result in a more holistic measure of children's regulatory capacities in response to stress. Finally, observing children's regulation of anxiety when they are alone could yield valuable results when compared to their anxiety regulation while in the presence of their mothers.

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